

**Interview summary:**

On Oct 28, 2005 a telephone interview was held between Robert Lodenkamper, Examiner Joseph H. Nguyen and Primary Examiner Drew Richards. The main purpose of the interview was to discuss the "energy spread" claim limitation (e.g., as in claim 1) in view  
5 of the Sverdrup reference (US 6,060,839).

Agreement with respect to the allowability of the claims was not reached during the interview. However, there was an acknowledgement by both Primary Examiner Richards and Examiner Ngyuen that the arguments raised in the conversation warrant reconsideration on the merits. Accordingly, this response to the advisory action is filed to further elaborate  
10 on the arguments made in the interview (and earlier in the prosecution).

It was agreed during the interview that no new issue is raised by the after-final amendment of independent method claim 23 to include the limitation of dependent article claim 14 made in the response filed 9/8/05 and made of record in the Advisory action of 9/28. Since Examiner Nguyen (in an earlier informal discussion) had indicated that this  
15 amendment may raise a new issue because it includes a limitation from a dependent article claim into an independent method claim, this agreement is hereby made of record.

**Detailed action --- claim rejections under 35 USC 102**

Claims 1-13, 23 and 24 stand rejected under 35 USC 102(b) as anticipated by US  
20 6,060,839 (hereinafter Sverdrup).

Independent claims 1 and 23 recite a limitation to an energy spread of emission electrons of less than about 1 eV.

Claims 1 and 23 are neither taught nor suggested by Sverdrup. In particular, Sverdrup has no teaching at all regarding the energy spread of the emission electrons.  
25 Examiner draws attention to lines 39-43 of column 3 of Sverdrup in connection with the present rejection of claim 14. However, this section of Sverdrup does not relate to the energy spread of emission electrons. Instead, it is a discussion of the effect of varying the primary (or seed) electron energy on emission electron current density. The pertinent claim limitation relates to secondary (i.e. emission) electrons instead of primary electrons, and also relates to

their energy spread as opposed to the emission electron current. Thus the indicated section of Sverdrup is simply irrelevant to the claim limitation to "an energy spread of said emission electrons at said emission surface is less than approximately 1 eV". The final office action maintains that an "energy spread of 1 eV" is mere optimization of a known result-effective variable. In sharp contrast, Applicant holds that the teachings of Sverdrup do not establish energy spread as a "result effective variable" (for anything) for the simple reason that Sverdrup does not discuss the energy spread of the emission electrons at all. The assertion that a numerical claim limitation is "mere optimization" falls apart unless the prior art establishes that the quantity thus described is a result-effective variable.

Examiner's comments in the office action appear to indicate that the emission electron current density is being identified with the energy spread of emission electrons. These two concepts are clearly distinct. In particular, knowledge of the emission electron current density gives no information on the emission electron energy spread, since the same current density  $J$  can be provided by a set of emission electrons having a large energy spread as by a set of emission electrons having a small energy spread. Thus, given a emission electron current density  $J$ , there is no way to deduce the energy spread of the emission electrons from  $J$ . Another significant distinction is that an energy (or energy spread) does not have the same physical unit dimensions as a current density.

A further concern raised during the interview is the question of whether or not it is inherent in the apparatus of Sverdrup that adjusting the electron current as he indicates necessarily (or inherently) leads to the claimed limitation on energy spread. A simple example suffices to demonstrate the impossibility of such inherency.

Consider two targets, target A being "too thin" according to the teachings of the present invention, and target B being thick enough to provide thermalization of the emission electrons according to the invention (e.g., as on lines 9-20 of page 7). Thus for target A, the emission electron energy spread will be large (i.e., greater than 1 eV), while target B will provide a small emission electron energy spread (i.e., less than about 1 eV), which is highly desirable for certain applications. Note that the effect of target thickness on the emission electron energy spread is appreciated by Applicant, but not by Sverdrup.

It is reasonable to suppose from the teachings of Sverdrup that increasing the primary electron energy will tend to increase emission electron current for both target A and for target B. However, the energy spreads in the two cases are radically different. This example explicitly shows the irrelevance of Sverdrup's teachings relating to emission electron current to the claimed invention.

Claims 2-13 depend from claim 1, and claim 24 depends from claim 23. Therefore, the above amendments and arguments in connection with claims 1 and 23 are also responsive to this rejection of claims 2-13 and 24.

#### **Detailed action --- claim rejections under 35 USC 103**

Claims 14-15 stand rejected under 35 USC 103(a) as unpatentable over Sverdrup.

Claim 14 is canceled. Claim 15 is amended to depend from claim 1. Therefore, the above amendments and arguments in connection with claims 1 and 23 are also responsive to this rejection of claim 15.

#### **Detailed action --- claim rejections under 35 USC 103**

Claims 16-19 stand rejected under 35 USC 103(a) as unpatentable over Sverdrup in view of US 5,684,360 (hereinafter Baum).

Claims 16-19 depend from claim 1. Therefore, the above amendments and arguments in connection with claims 1 and 23 are also responsive to this rejection of claims 16-19.

#### **Detailed action --- claim rejections under 35 USC 103**

Claims 20-22 stand rejected under 35 USC 103(a) as unpatentable over Sverdrup in view of US 5,592,053 (hereinafter Fox).

Claims 20-22 depend from claim 1. Therefore, the above amendments and arguments in connection with claims 1 and 23 are also responsive to this rejection of claims 20-22.

## Remarks

Reconsideration of the merits of this case in view of the record (especially this response and the telephone interview) is respectfully requested. If such reconsideration leads the Examiner to maintain the claim rejections, it is earnestly requested that Examiner call the undersigned below to explore ways to expedite prosecution before issuing a second unfavorable Advisory Action.

Respectfully submitted,



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Robert Lodenkamper, Reg. No. 55,399

LUMEN INTELLECTUAL PROPERTY SERVICES  
2345 Yale Street, Second Floor  
Palo Alto, CA 94306  
(O) 650-331-8414